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PROVISIONAL APPLICATION COVER SHEET

is is a request for filing a PROVISIONAL APPLICATION under 37 CFR 1.53(b)(2).

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TITLE OF THE INVENTION (280 CHARACTERS MAX)

WIRELESS CONTROL FOR CREATION OF, AND COMMAND RESPONSE TO, STANDARD FREIGHT SHIPMENT MESSAGES

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ENCLOSED APPLICATION PARTS (check all that apply)

Specification	Number of Pages: 6	☒ Small Entity Statement **APPLICANT IS A SMALL ENTITY**
Drawing(s)	Number of Sheets: 3	☐ Other (specify)

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Provisional Filing Fee Amount: $ 80.00 **APPLICANT IS A SMALL ENTITY**

: invention was made by an agency of the United states Government or under a contract with an agency of the United States Government.

No.

Yes, the name of the U.S. Government agency and the Government contract number _____

spectfully submitted,

nature Leo Stanger Date: 6/26/03

Leo Stanger

Additional inventors are being named on separately numbered sheets attached hereto.

WIRELESS CONTROL FOR CREATION OF, AND COMMAND RESPONSE TO, STANDARD FREIGHT SHIPMENT MESSAGES

Field of the Invention

This invention relates to remote control of freight assets during transit or other states.

Background of the Invention

Condition of freight assets have in the past been detected by sensors, and alarms alerted attendants of adverse conditions. Such systems have been cumbersome and presented difficulties.

Summary of the Invention

An embodiment of the invention involves transmitting sensed conditions of freight assets via one format to a monitoring system, which sends the data to a user utilizing another, user compatible, format.

Another embodiment involves the monitoring system comparing the sensed conditions with requirements from a user and sending the discrepancy to the user.

Another embodiment involves the monitoring system commanding devices of the freight asset to correct discrepancies.

These and other aspects of the invention are pointed out in the claims. Objects and advantages of the invention will become evident from the following detailed description when read in light of the accompanying drawings.

Brief Description of the Drawings

The drawings illustrate various embodiments of the invention.

Detailed Description of Preferred Embodiments

This invention utilizes wireless intelligence on a freight asset to evaluate status conditions that automatically trigger transmissions and generate industry standard freight industry messages, which may be used for tracking and monitoring of freight assets and shipments. A corollary of the invention utilizes industry standard freight shipment messages that are evaluated against wireless messages transmitted from a freight asset with wireless intelligence to send command actions to the asset, which change or alter a monitored freight condition. Another corollary involves a method that permits a user to create an industry standard freight message by sending a wireless notification to an asset, which responds to the notification with a wireless transmission, and results in an industry standard freight message.

A basic embodiment of the invention appears in Fig. 1. Here, a specialized aspect of this invention involves a particular condition of a freight asset FA1, monitored in real-time, which creates an alarm or event condition concerning the asset within an intelligent electronic device ED1, by virtue of the intelligence of that device. The alarm or event condition is sent via an encoded wireless communications link CL1 to a wireless monitor system MS1 having a database DB1. The wireless message from the electronic device ED1 is encoded particularly for the bandwidth restrictions of the wireless communication link CL1. In the wireless monitor system MS1 a translator TR1 formats the message into

a standard Electronic Data Exchange (EDI) or Extensible Mark-up Language (XML) freight message FM1 containing relevant information regarding the asset. The translator TR1 transmits the message FM1 to users at a user system US1 having information systems that accommodate the standard message types EDI or XML, and a database DB2. This process permits the intelligent electronic device ED1 of the monitoring system on the freight asset FA1 to transmit standard, "open systems" messages, which are delivered into the existing information systems of user's of freight equipment. The device ED1 on the asset FA1 automatically evaluates a particular condition to provide information that is normally derived from other sources (i.e. wayside monitoring systems that tell when an asset passes by and human creation of events that occur at under specific conditions). One example of this embodiment of the invention involves the local knowledge of location of the asset FA1, by use of a geographic positioning system (gps) sensor or equivalent, when the asset FA1 moved into a user designated location, where the asset FA1 would generate a wireless message, formatted into an industry standard message by the translator TR1 for delivery into the user system US1 and its database DB2. The newly formatted message from the translator TR1 contains information delivered from the asset FA1, including for example, gps location, time of arrival or departure, and the condition of the freight (door position, temperature, set point temperature, presence of auxiliary equipment, etc.). Another example of this process involves a laborer changing the temperature set point on the asset FA1, such as a refrigerated trailer or railcar, which causes the device ED1 to generate an encoded wireless message that the translator TR1 ultimately delivers as a standard industry message FM1 to the user at user system US1with its database DB2. With these given

messages, the user may compare the wireless generated information from equipment located on the asset to shipping records and provide immediate context to the shipment without the need for local reading devices or operator inputs. Fig. 2 illustrates steps in the operation.

Another embodiment appears in Figs. 3 and 4. This involves the generation of a wireless command by the monitor system MS1 to the asset FA1 to change a condition based on a discrepancy between an industry standard freight message FM2 and information transmitted from the freight asset FA1 using encoded wireless communications via the device ED1. Upon the receipt of the industry standard freight message FM2 generated by the user system US1 with its database DB2 specific to an individual freight asset FA1, the monitor system MS1 compares recent encoded wireless messages from the asset FA1 via the electronic device ED1 to the newly received freight message FM2. Should an exception occur resulting from a discrepancy between the originating freight message FM2 and the encoded wireless message, which involve a specification for the freight shipment, such as a destination, temperature setting, routing violation, and recent wireless messages, then the monitor system MS1 sends a wireless command to the intelligent electronic device ED1 on the asset FA1, which changes the condition of the asset FA1. In one example, a user sends an industry standard freight message FM2, via the database DB2 to the monitor system MS1, specifying a specific temperature setting for a commodity contained within a specific freight asset FA1, and the temperature setting is compared to, and found different from, a recently received actual temperature setting received via encoded wireless communications from the asset FA1 via the device ED1. Then an automatic command is sent to the intelligent electronic

device ED1 instructing it to change the temperature set point to the newly prescribed temperature setting of the message FM2. Upon enacting the change in temperature, the electronic device ED1 sends an encoded wireless message confirming that the action took place. The translator TR1 in turn forwards this message in an industry standard freight message EDI or XML. Another example involves the automatic sending of a command to a unit to lock the freight doors once the asset has left a prescribed location delivered to the monitor system MS1 via an industry standard message.

Yet another embodiment appears in Figs. 5 and 6. This involves a method to create a standard freight industry message by accessing a monitor system MS1 and sending a command via wireless communications to an intelligent device attached to a freight asset. Upon receipt of the command from the user via monitor system MS1, the intelligent device ED1 creates a transmission that results in an industry standard freight message in a method similar to the embodiments above.

In these embodiments, the standard freight messages FM1 involve, for example, bills of lading (404), waybills (417), Terminal Operations and Intermodal Ramp Activity (322) messages and car location messages, which contain relevant information about freight shipments. These messages, and related messages, are created from encoded wireless messages via satellite, cellular or radio frequency communications in the first embodiment, Figs. 1 and 2. In an embodiment, these messages, and related messages, specify the actual conditions of the freight, and the wireless communications links assure, via control mechanisms, that the freight shipment meets the specification.

The invention permits real time transmission of freight asset conditions, freight control signals, and confirmation signals between wireless, e.g. satellite, transmission formats and standard message formats EDI or XML.

The database DB1 stores all incoming and outgoing messages to and from the wireless monitor system MS1. If the monitor system MS1 receives a message from the user system US1 with its database DB2 to alter the status of the freight asset FA1, the database DB1 stores the command as the translator TR1 transmits the message to the electronic device ED1. When the latter effects the requested change in the status of the freight asset FA1, it sends back a confirmation to the monitor system MS1 which compares the resulting change with the command stored in the database DB1 to assure compliance. The translator TR1 the sends the result via standard message formats EDI or XML to the user system US1 with its database DB2.

The database DB1 also stores contact information for alarms, as well as user preferences. The user may for example be a freight forwarding company, a railroad company, a truck company, a refrigeration company, etc.

The term freight assets may refer to a freight cars, motor trucks, the freight carried, their temperatures, destinations, and/or other conditions of operations. The freight assets can also include freight equipment, and its weights, loads, and pressures.

In Fig. 5 the user may address the wireless monitor system MS1 directly by telephone, e-mail, or web-address, etc.

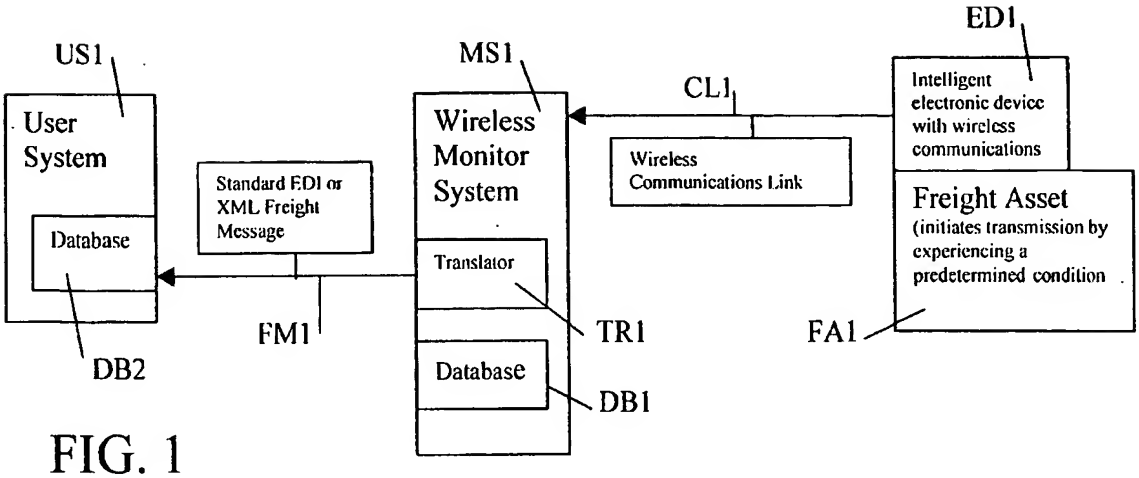
US1
User System
Database
DB2
Standard EDI or XML Freight Message
FM1
MS1
Wireless Monitor System
Translator
TR1
Database
DB1
CL1
Wireless Communications Link
ED1
Intelligent electronic device with wireless communications
Freight Asset
(initiates transmission by experiencing a predetermined condition
FA1

FIG. 1


User Notification
Freight Condition Changes
(geofence location, temperature change, unlocked door)

FIG. 2

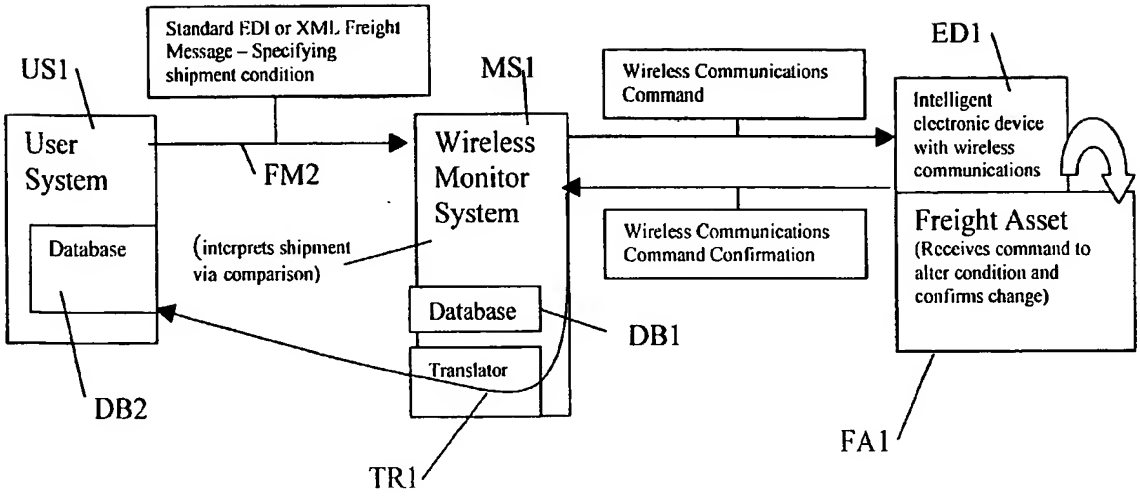
Standard EDI or XML Freight Message – Specifying shipment condition
US1
MS1
Wireless Communications Command
ED1
Intelligent electronic device with wireless communications
User System
FM2
Wireless Monitor System
Freight Asset
(Receives command to alter condition and confirms change)
Database
(interprets shipment via comparison)
Wireless Communications Command Confirmation
Database
DB1
Translator
DB2
TR1
FA1

FIG. 3

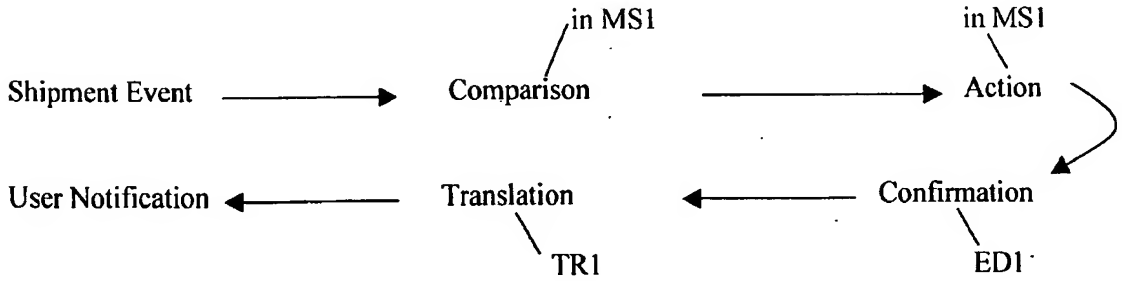
in MS1
in MS1
Shipment Event
Comparison
Action
User Notification
Translation
Confirmation
TR1
ED1

FIG. 4

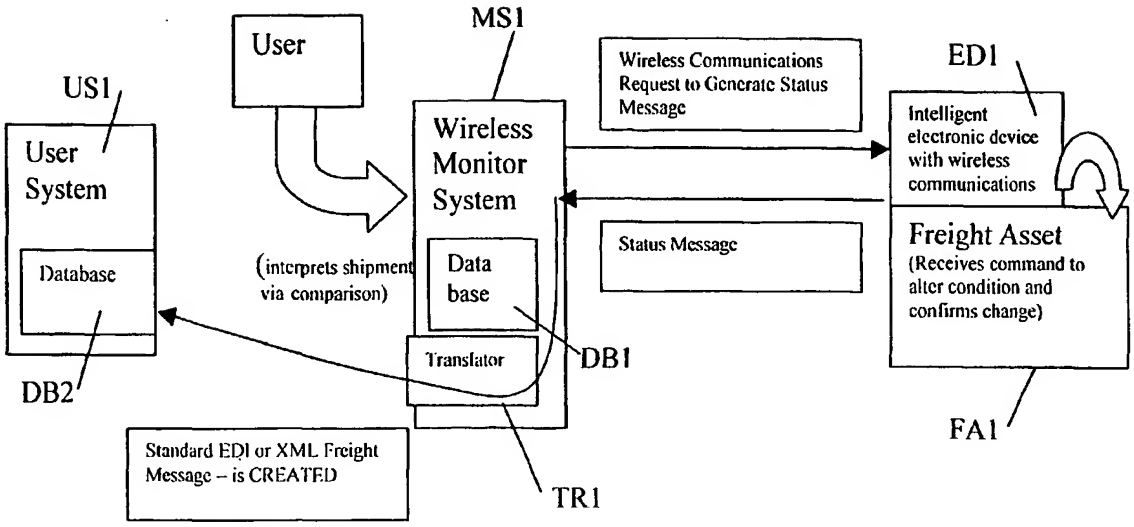
User
MS1
US1
Wireless Communications Request to Generate Status Message
ED1
User System
Wireless Monitor System
Intelligent electronic device with wireless communications
Database
(interprets shipment via comparison)
Data base
Status Message
Freight Asset
(Receives command to alter condition and confirms change)
Translator
DB1
DB2
FA1
Standard EDI or XML Freight Message – is CREATED
TR1

FIG. 5

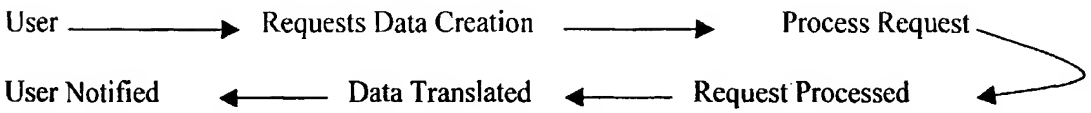
User
Requests Data Creation
Process Request
User Notified
Data Translated
Request Processed

FIG. 6